



## List of Modules and Courses

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## Web Application Developer Course Descriptions

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Course Title	Hours per module	Hours
<b><u>IT Foundations</u></b>		
Introduction to Program for Web Developer **		2
Introduction to PCs & MS Windows		12
MS Word 2000 Fundamentals		8
MS Excel 2000 Fundamentals		8
MS Powerpoint Fundamentals		8
MS Word 2000 Intermediate		8
MS Excel 2000 Intermediate		8
Computer Architecture and Operating Systems Concepts		28
Linux Basics		26
Internet Fundamentals		12
WD Assessment Test # 1 (Intro to Program, IPCW, CAOS, LINUX, INTERF)		2
	122	
<b><u>Programming Fundamentals</u></b>		
Programming Fundamentals		16
Introduction to Programming with C		56
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WD Assessment Test # 2 (PgmFund, C, DSA)		2
RDBMS Concepts and SQL		32
Networking Essentials		16
WD Assessment Test # 3 (RDBMS, NWESS)		2
	156	
<b><u>OO, Java, and DB Programming</u></b>		
Object Oriented Programming with C++		60
WD Assessment Test #4 (CPROG)		2
Core Java		88
WD Assessment Test # 5 (JAVA)		2
DB Programming & Stored Procedures		40
Software Engineering		24
OO Analysis and Design using UML		16
Project #1 ebAD		32
WD Assessment Test # 6 (SWENG, OOAD)		2
	266	
<b><u>Advanced Web Development</u></b>		
e-business Technology Fundamentals		16
Design Methodology & Technology		30
Web Programming II (ASP, CGI, VBScript)		32
WD Assessment Test # 7 (ebFund, DMT, WP11)		2
IBM WebSphere Studio Workshop		36
Project #2 Web Dev		28
e-business Security **		16
e-Commerce Strategies and Practices		30
Enterprise Appl Dev using XML		44
WD Assessment Test # 8 (WSSTUD, ECSP, EBSEC, EADXML)		2
	236	
		<b>780</b>
** Available in late 2003		

## Web Application Developer Course Descriptions

### Module 1 – IT Foundations

#### ***Introduction to Web Application Developer Program (CY130) - AVAILABLE IN LATE 2003***

**Duration**

The duration of the course is 8 hours

**Purpose**

This course introduces the students to the ACE program for Web Application Developers. It is important for students to have an understanding of what skills they will learn in this program and what job they will be qualified to do when they complete the program. This course will provide an in-depth overview of this information so students will be motivated to continue in program

**Audience**

ACE Students starting the Web Application Developer Career program

**Prerequisites**

None

**Objectives**

The objectives of this introductory course are to:

- Review the roadmap for this ACE program
- Explain the reason for each course to be included in the program
- Discuss the potential jobs that this program will prepare the students to do
- Give the students an opportunity to view a very Web site and make a change to the Web site in order to have an idea of what a Web Developer does

Each unit in this course is two hours in duration.

#### ***Introduction to PCs and Windows 2000 (CY110)***

**Duration**

The duration of the course is 12 hours.

**Purpose**

The aim of the course is to provide the student with an overview of a computer and its organization. It introduces the various computer components, its peripherals – input and output devices. The course discusses the different types of computers, the basic concepts of hardware and software, and also the basics of computer networking.

The course introduces the concept of an operating system through Windows 2000. Students will get familiarized to the use of files and folders, and operations performed on them. They will also learn the use of multiple files and folders, as well as command prompts and their usage.

The course introduces the students to Editors, which are an important part of any activity on a system. Customizing Windows 2000 aids the user of the system to work with the system in the way he/she wants. The course guides the student through the concepts with the help of simple examples.

This course, Introduction to PCs and Windows 2000, incorporates adequate Lab sessions, where the students will be able to gain practical experience.

Students, professionals, and developers who wish to know about personal computers and to work with MS Windows

**Audience**

After completing this course, you will be able to:

- Describe the various components of a computer, its peripherals, and its organization.
- Discuss the characteristics of the various components in a computer, and understand the connection between one another.
- Identify various Windows components and perform various Windows activities.
- Work with files and folders, and get familiar to perform operations on them.
- Work with multiple files and folders.
- Use menus and toolbars, and perform text-editing operations.
- Customize Windows 2000, starting with the basics.
- Perform operations like move, resize, and hide taskbar.
- Edit text by performing operations like cutting, copying and pasting.
- Execute operations like open, save and print a file, and work with the formatting commands.
- Personalize menus and create shortcuts to the desktop.
- Discuss disk error repair and defragmentation.
- Install and uninstall software.

**Prerequisites**

None

**Objective**

After completing this course, you will be able to:

- Describe the various components of a computer, its peripherals, and its organization.

## Web Application Developer Course Descriptions

- Discuss the characteristics of the various components in a computer, and understand the connection between one another.
- Identify various Windows components and perform various Windows activities.
- Work with files and folders, and get familiar to perform operations on them.
- Work with multiple files and folders.
- Use menus and toolbars, and perform text-editing operations.
- Customize Windows 2000, starting with the basics.
- Perform operations like move, resize, and hide taskbar.
- Edit text by performing operations like cutting, copying and pasting.
- Execute operations like open, save and print a file, and work with the formatting commands.
- Personalize menus and create shortcuts to the desktop.
- Discuss disk error repair and defragmentation.
- Install and uninstall software.

### Agenda

Each unit in this course is one hour in duration.

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### Computer Architecture and Operating Systems (CY340)

#### Duration

The duration of the Course is 28 hours.

#### Purpose

The aim of the course is to introduce the student to Computer Architecture and various concepts in operating systems. The aim of the course is to familiarize students with the operations that take place in a computer system. The course deals with the components in a computer, various architectures, and memory.

The first part of the course provides an overview on computer systems and its variations, the characteristics of processors, digital circuits, and the nature of equivalent, combinational and sequential circuits. Students will also be able to understand how number systems evolved, and the number systems used by computer systems. They will also learn how real numbers are represented in a binary system, and about the various number systems that are understood by computers.

The second part of the course introduces the student to the organization of the central processing unit (CPU) and memory. It provides an overview on Microprogramming, machine language and Input/Output organization. Students will learn about the principles and objectives of I/O software, and about device management. They will also get familiarized with RISC and CISC architecture.

The third part of the course deals with the concepts in operating systems and provides an overview on systems programming. Students will learn about virtual machines and language processors, and its different phases. Operating systems will be dealt with, in detail, in this part of the course. Students will also learn about resource abstraction, multitasking, process management and its objectives, memory, file, and device management.

#### Audience

Students, professionals, and developers who wish to know about the architecture of a computer and concepts about operating systems.

#### Prerequisites

None

#### Objectives

After completing this course, you will be able to:

- Explain the organization of computer systems.
- State the characteristics of various digital circuit elements.
- Understand the usage of Boolean algebra in constructing digital circuits.
- Discuss the evolution of number systems, and explain the number systems used by computers.
- Explain the organization of central processing units.
- List the principles of Input/Output hardware and devices.
- Get familiarized with device management.
- Explain various systems software, and language processors.
- Discuss operating systems and their functional aspects.
- Explain the concepts involved in multiprogramming, time-sharing and multi-tasking.
- List the aspects involved in process management, and process scheduling.
- Define the objectives of memory management and the various types of memory management schemes used in operating systems.
- Understand the fundamentals of file management and the necessity for file management systems.
- Classify devices, and discuss device management.

### Agenda

Each unit in this course is one hour in duration.

## Web Application Developer Course Descriptions

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### **LINUX Basics (CY310)**

#### **Duration**

The duration of the course is 26 hours

#### **Purpose**

This course offers students an overview of the Linux operating system. The first part of the course introduces some of the preliminary concepts of Linux as an OS with increasing popularity. Students will be able to learn the basic commands of the Linux System, its structural organization and file systems. They will also learn to create directories and files and manage them. The course also provides an overview of the vi editor – one of the most widely used editors on Linux.

The second part of the course gives a description of the Linux shell, one of the prime components that a user interacts with, along with simple commands of shell. Students will finally learn about the concepts of Linux processes. The course also describes methods by which the Linux environment could be customized to suit individual needs.

The course on Linux Basics incorporates several Lab sessions where students would be able to gain practical experience on Linux.

#### **Audience**

Students, Professionals, and Business people

#### **Prerequisites**

None

#### **Objectives**

After completing this course, you should be able to:

- Explain an operating system
- Discuss the evolution of Linux, and it's hardware requirements
- Describe the organization of the Linux operating system
- Provide an overview of the Linux shell
- Discuss Linux's capability to process text, program and provide documentation for commandsExplain the log in / log out procedure on a Linux operating system
- Discuss the use of the command format of Linux
- Explain the use of some basic Linux commands
- Discuss the usage of pipes and filters

#### **Agenda**

Each unit in this course is two hours in duration.

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### **Internet Fundamentals (CY170)**

#### **Duration**

The duration of the course is 8 hours

#### **Purpose**

*Internet Fundamentals* is a 6-hour course designed to guide students through the Internet and its wide array of useful resources. Students learn how to use key Internet technologies, such as Web browsers, e-mail, newsgroups, File Transfer Protocol (FTP), Telnet, and search engines. Students gain experience configuring both Netscape Navigator and Microsoft Internet Explorer to access rich multimedia, including RealPlayer, Shockwave and Flash content. Students also use a variety of Web-based search engines to conduct advanced searches and learn the basics of electronic commerce and security issues.

#### **Audience**

Students, Professionals, and Business people

#### **Prerequisites**

No experience using the Internet is necessary. An understanding of Microsoft Windows 95/98/2000 is required.

#### **Objectives**

Unit 1: Overview of the Internet

Trace the evolution of the Internet

Define TCP/IP and explain how it is used

Describe the client/server model

Describe push and pull technology

List criteria for selecting an ISP

Identify and describe Internet protocols

Explain domain names and virtual domains

Discuss the ICANN and the InterNIC

Unit 2: Browsing the World Wide Web

Describe the origins of the Web

Define the term legacy application

Unit 5: Objects, Plug-ins, and Viewers

Define objects and their relationships to multimedia

Explain the basics of C, C++, Java, JavaScript, ActiveX,

JScript and VBScript

Describe the purpose of plug-ins

Identify plug-ins and viewers

Listen to and view multimedia objects

Identify various file formats

Unit 6: Search Engines

Explain the function of search engines

Promote a Web site with enhanced search engine positioning

Explain the functions of static, keyword and full-text search

indexes

Use Boolean operators in a Web search

## Web Application Developer Course Descriptions

Access, view and navigate Web pages	Search for graphics, people and mail lists
Enter URLs	Discuss Archie, Gopher and Veronica
View Web page source code	Unit 7: Security
Set preferences for a Web browser	Describe cookies and their purpose
Use history folders and empty caches	Control Web server access to cookies
Explain the function of the WAP	Configure browser security preferences
Unit 3: E-Mail	Identify security risks of sending Web data
Send and receive e-mail messages using various e-mail client programs	Describe the importance of HTTPS
Define and practice netiquette	Describe authentication, digital certificates and encryption
Create and add e-mail signatures to e-mail messages	Discuss computer viruses and firewalls
Attach a file to an e-mail message	Unit 8: E-Commerce
Describe the purpose of mailing lists	Define e-commerce
Unit 4: FTP, Newsgroups and Telnet	Identify the features of EDI and SET
Access and download files using FTP	Discuss e-commerce issues
Describe the functions of the FTP get and put commands	Define e-commerce payment models
Read and post messages to newsgroups	Describe the functions of smart cards
Access resources using Telnet	Discuss copyrights, licensing and trademarks
	Describe the basics of project management

### Agenda

Each unit in this course is one hour in duration.

## Web Application Developer Course Descriptions

### Module 3 – Programming Fundamentals

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#### ***Programming Fundamentals (CY300)***

**Duration**

The duration of the course is 16 hours.

**Purpose**

If you are just starting out as a programmer and need an introduction to the basics of programming, you will learn the elements of the development process for mainframe applications. This course covers program and data structures and the number of systems used in this environment. You will learn the components of a mainframe configuration, understand hexadecimal and binary number systems and the standard elements of a host application program.

**Audience**

Anyone who wants a basic knowledge in the fundamentals of programming.

**Prerequisites**

None.

**Objectives**

After completing this course, students will be able to create functional Web pages using HTML

- Create basic program logic.

- Recognize the steps necessary to go from program design to execution.

- Use binary and hexadecimal notation and in traditional mainframe environments.

- Describe the various components of a mainframe configuration.

**Agenda**

Each unit in this course is two hours in duration.

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#### ***Introduction to Programming Using C (CY320)***

**Duration**

The duration of the course is 56 hours

**Purpose**

This course is designed to equip students to write programs using C. On completion of the course, students should have the skills required to write small C programs which consist of conditional and iterative statements.

**Audience**

Individuals interested in learning to program in the C language,

**Prerequisites**

Familiarity with the usage of the PC, working knowledge of any flavor of UNIX.

**Objectives**

This module is aimed at those who have no prior programming skills. The course covers the syntax of the C language, with the emphasis on the development of the skills needed to design algorithms for problems and converting them to C programs.

- Introduction to Computing
- Basic Notions
- Our first C program
- Constants, Variables and Types
- Operators, Expressions and Statements
- Input and Output
- Control Statements

**Agenda**

Each unit in this course is two hours in duration.

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#### ***Data Structures and Algorithms (CY330)***

**Duration**

The duration of the Course is 32 hours

**Purpose**

The aim of the course is to introduce the student to data structures and algorithms used in computing systems. The first part of the course provides an overview of data types and data structures, linked lists, stacks, and queues.

Students will get familiarized with the role of data structures in solving problems and applications using list data structure. Students will learn about the need for linked lists and implementation of lists as arrays. They will also learn about abstract data type stack and the application of stacks. This course also deals with the implementation of queues as arrays and applications of queues.

The second part of the course deals with graphs as data structures, set representation of graphs and applications of graphs. Students will learn about trees as a data structure and traversal methods for a binary tree. Students will also get familiarized with sorting techniques and searching techniques.

## Web Application Developer Course Descriptions

The course includes several practical sessions to help students get acclimatized to the topics learnt in the course.

### Audience

Individuals with few programming skills who need an understanding of database and algorithms. This course provides each participant with an understanding of the role of data structures and algorithms as building blocks in most computer programs.

### Prerequisites

- Understanding of basic programming concepts
- Overview of general features of a programming language
- Problem solving using C programming language
- Practical experience in using advanced features of C like pointers and files
- These skills can be obtained by completing the following course **CY320 : Introduction to programming with C**

### Objectives

After completing this course, you should be able to:

- Define data types and data structures
- Discuss the need for linked lists
- Understand the difference between array and linked implementation of a list
- Explain the stack data structure
- State the applications of stacks
- State the definition of abstract data types queue and implement a queue using an array
- Define graphs and their applications
- Define tree as a data structure and discuss binary trees
- Explain the various sorting techniques
- State the various search techniques and discuss hash tables as an enabling data structure

### Agenda

Each unit in this course is two hours in duration.

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### ***RDBMS Concepts and SQL (CY350)***

#### Duration

The duration of the course is 32 hours.

#### Purpose

The aim of this course is to introduce the student to the concepts of Relational Database Management Systems (RDMS) and Structured Query Language (SQL). The course provides an overview of the database design and its advantages. The course discusses conceptual database models and, recursive and exclusive relationships pertaining to database design. This course will also provide an understanding of the concepts of normalization and normal forms in relational databases.

The second part of the course deals with SQL in detail. It offers an overview of data tables, aggregate functions, and the parent-child relationship in SQL. Students will also get an introduction to Advanced SQL in this part of the course.

The third part of the course deals with DB2 fundamentals. Students will be able to understand the creation and management of database objects. The course also explains concepts such as, database dictionary, database access and security. The course also provides several Lab. exercises to improve the practical skills of students in database management.

#### Audience

Anyone interested in learning relational database overall concepts, access and management and product samples.

#### Prerequisites

CY340

#### Objectives

After completing this course, you will be able to:

- Discuss the concepts of RDMS.
- Understand the database design process, and the conceptual model.
- Define normalization and understand the need for normalization.
- Discuss SQL and data tables.
- Get familiar with advanced SQL and its concepts, such as, primary and foreign keys.
- Understand DB2 fundamentals and its capabilities.
- Learn to create and manage database objects.
- Discuss data types and column definitions.
- Learn about database access and security concepts.

#### Agenda

Each unit in this course is two hours in duration.

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### ***Networking Essentials (CY360)***

#### Duration

The duration of the Course is 16 hours

#### Purpose



## Web Application Developer Course Descriptions

The aim of this course is to introduce the student to computer networking. The course provides an overview of the components of a network and the different types of data communication networks. The course discusses protocol suites and the concept of internetworking.

In the first part of the course, students will learn about Internet Protocol (IP), the concept of IP addresses and Internet datagrams. They will also learn about Transmission Control Protocol (TCP), TCP operations and application layer protocols. Sockets and remote procedure calls are also discussed.

The second part of the course relates to network handling. Students will learn about network devices and get familiarized with the fundamentals of network management. The course also discusses the issues of data management, protection and disaster planning.

### **Audience**

Students, professionals, and developers who wish to know about the basics of networking.

### **Prerequisites**

None

### **Objectives**

After completing this course, you should be able to:

- Describe the benefits of networks and the various types of data communication networks
- Discuss protocol suites and the ISO-OSI model
- Describe IP and IP addresses
- Define TCP and TCP operations
- State the various levels of management protocol and describe the Internet protocol suite
- Discuss sockets and remote procedure calls
- Get familiar with network devices such as repeaters, bridges and routers
- Discuss the fundamentals of network management and the issues of network security
- Acquire an understanding of network security models

### **Agenda**

Each unit in this course is two hours in duration.

## Web Application Developer Course Descriptions

### Module 4 – Object Oriented, Java, and Database Programming

#### **Object Oriented Programming Using C++ (CY410)**

##### **Duration**

The duration of the Course is 60 hours

##### **Purpose**

The first volume of this course provides an overview of object-oriented concepts. Students will get to learn about programming paradigms, polymorphism, and the advantages of the object-oriented development system. They will also learn about classes and objects, methods, and messages. The concept of abstract classes, identification of classes, and assigning responsibilities are also covered extensively.

The second volume of the course deals with C++ terminologies and teaches students about compiling C++ programs. It also deals with member functions, message passing, and dynamic object creation and destruction. Students will get familiarized with friend classes, nested classes, static functions, and the concept of inheritance. They will also learn about access restrictions and inheritance, constant data, and member functions.

The third volume of the course introduces polymorphism, dynamic binding, virtual functions, and virtual destructors. Students will learn about operator overloading in detail. They will also learn about multiple inheritance and Run-Time Type Information (RTTI).

The fourth volume of the course deals with templates, static members and variables, raising and handling exceptions. It provides an overview of working with templates and the Standard Template Library (STL). It also teaches students about derived exceptions and handling exceptions of similar type.

The fifth and the final volume of the course deals with the concept of input and output. Students will get familiarized with input streams, output streams, and file streams. The course also provides an overview of input/output on user-defined classes. It explains the input and output of user-defined data types.

The course incorporates several Lab. sessions where students would be able to gain practical experience in object-oriented programming in C++.

##### **Audience**

This course is designed for Web and Application developers.

##### **Prerequisites**

Introduction to Programming with C (CY320), Data Structures and Algorithms (CY330)

##### **Objectives**

After completing this course, you will be able to:

- Describe and list the benefits of object-oriented technology
- Discuss abstraction, aggregation, inheritance, and polymorphism
- Describe classes and objects and their use in object-oriented systems
- Use classes, objects, and messages in a practical situation
- Use CRC cards as a first step towards object-oriented analysis
- Apply the principles of CRC card design
- Describe the terminologies used in C++
- Compile C++ programs on the Linux operating system
- Define a class and instantiate an object of a class
- Discuss the order of construction and destruction of objects
- Describe the need for and use of static members in a class
- Create a class in C++
- Discuss how C++ deals with inheritance
- Explain the concepts of overloading and overriding with respect to inheritance
- Work with the restrictions imposed on inheritance
- Discuss constant data and member functions
- Pass class objects by reference
- Write codes that handle constants in function calls
- List the types of polymorphism and examine the use of virtual functions in implementing polymorphism
- Describe the nature of pure virtual functions and their usage
- Discuss the mechanism behind overloading and function selection
- Deal with the methods of operator overloading
- Work with overload operators for a user-defined class
- Define public and private inheritance and discuss repeated inheritance
- Create derived classes out of more than one base class
- Explain the need for templates in programming
- List the differences between inheritances and templates
- Apply generic function templates on different data types
- Use inheritance with templates
- Describe the ways in which working with templates is made better
- Describe exception handling in C and C++
- Declare the exception throwing functions

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## Web Application Developer Course Descriptions

- Explain the creation of exceptions
- Describe the grouping of exceptions and work with derived exceptions
- Define manipulators and describe the file input/output streams
- Work with input on user-defined data types
- Explain how output on user-defined data types are performed

### Agenda

Each unit in this course is two hours in duration.

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### Core Java (CY420)

#### Duration

The duration of the course is 88 hours.

#### Purpose

This course offers students an overview of Core Java. The first volume of the course deals with Java basics, the impact of Java on the World Wide Web, object orientation in Java, operators and control structures. Students will learn about Java features, naming conventions, variable declaration and initialization.

The second volume of the course deals with object-oriented programming. It provides an overview of members of a Java class, usage of class methods, and memory management in Java. Students will learn about the basics of inheritance, the basics of abstract classes and methods and interfaces. They will also learn about commonly used in-built packages of Java.

The third volume of the course deals with exceptions, the methods of raising exceptions. Students will learn how to differentiate between checked and unchecked exceptions. They will also learn about how user-defined exceptions can be created and used.

The fourth volume of the course provides an overview of Input/Output facilities. It deals with files and streams, character streams, the reader and writer classes and random access files. It also deals with object serialization, the serializable interface and the externalizable interface. Students will also learn about the ObjectOutputStream class and the ObjectInputStream class.

The fifth volume of the course provides an overview of user interfaces using AWT. It deals with AWT classes and containers, painting and updating user interface components. It also deals with sample methods inherited by AWT components from component and container Classes. Students will learn about layout managers, the process of creating a layout manager and associating it to a container. They will also learn about the event delegation model and event handling.

#### Audience

This course is designed for Web and Application developers.

#### Prerequisites

CY410, CY350

#### Objectives

After completing this course, you should be able to:

- Discuss the main features of Java
- Explain the principles of object-orientation in Java
- Explain various control structures used in Java
- Discuss the need for and use of constructors for a class
- Describe the memory management is performed in Java
- Describe how to create an inheritance hierarchy
- Define and explain how to implement an interface
- Explain classpath variables and describe its usage
- Discuss exceptions and the traditional error handling techniques
- Describe exception handling in Java
- Examine different ways in which exceptions can be thrown, caught, and handled
- Discuss the File class
- Explain the various character streams and byte streams
- Discuss the Serializable Interface and the ObjectInputStream class
- Describe some useful classes and some GUI components in AWT
- Discuss how to choose a layout manager and its responsibilities
- Explain how to implement the event delegation mechanism
- Distinguish an applet from an application
- Describe methods for adding UI components
- Discuss advantages of the Applet API
- Explain the concepts of threads and multithreading
- Discuss how to create threads from the Thread class and Runnable interface
- Describe the concept of synchronization
- Explain synchronized methods and statements
- Discuss URLs and URL exceptions
- Discuss connection-oriented and connectionless sockets
- Discuss collection interfaces
- Describe the polymorphic algorithms of JDK operating on collections
- Discuss the JDBC API

## Web Application Developer Course Descriptions

- Explain exception handling in JDBC
- Explain the use of `PreparedStatement` and `CallableStatement` in JDBC
- Discuss some of the JDBC support classes in Java
- Discuss the manipulation of objects of a class
- Discuss security issues while working with Java programs
- Discuss the packaging of Java components
- Describe the MVC architecture
- Discuss layout managers defined in Swing
- Describe the look and feel properties of Swing
- Discuss the Java 2D API

### Agenda

Each unit in this course is two hours in duration.

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### Database Programming and Stored Procedures (CY430)

#### Duration

The duration of the course is 40 hours.

#### Purpose

The aim of the course is to introduce students to database technologies. The first part of the course provides an overview of database applications, DB2 programming fundamentals and JDBC and SQLJ programming. It also covers application packages, triggers and embedded SQL concepts. Students will learn to use the syntax of SQLJ and write applets and applications using SQLJ.

The second part of the course deals with DB2 stored procedures. It provides an overview of stored procedure concepts, control flow statements, application logic and error handling. Students will learn how to develop SQL/PL stored procedures and to debug programs using stored procedure builder. They will also learn about coding stored procedures in Java.

The third part of the course deals with User Defined Types, User Defined Functions and large objects. Students will learn about UDF programming in Java and about data operations on large objects.

The last part of the course deals with advanced RDBMS concepts. Students will learn about concurrency control, classification of failures and backup methods. They will also learn about different database systems and the distributed transaction model.

The course includes several practical sessions to help students get acclimatized to the topics learnt.

#### Audience

This course is designed for Database application designers and database application programmers supporting DB2 stored procedures with the SQL database language.

#### Prerequisites

CY360, CY420

#### Objectives

After completing this course, you should be able to:

- Explain database applications and describe DB2 programming fundamentals
- Understand Java programs and applets that interact with DB2
- Group applications into Logical Units of Work
- Explain the concept of triggers and how to use them with various database objects
- Analyze embedded SQL concepts and discuss SQLJ syntax
- Explain the need for stored procedures, and where to use them
- Explain how to build stored procedures using SQL/PL
- Write stored procedures using SQL/PL, build the programs, and register them with DB2
- Explain how to develop stored procedure servers in Java
- Explain the concepts of UDT and UDF
- Work with table functions
- Provide an overview of concurrency control and the database recovery process
- Briefly state the validation-based protocols and provide a brief classification of failures
- Describe decision support systems and transaction management

### Agenda

Each unit in this course is two hours in duration.

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### Software Engineering (CY440)

#### Duration

The duration of the course is 24 hours.

#### Purpose

This course is designed to provide the database application designer or application programmer with the knowledge to specify, plan, develop, and test a Software product as well as assure the quality of this product.

#### Audience

This course is designed for application designers and developers

## Web Application Developer Course Descriptions

### Prerequisites

Before taking this course, you should understand the basics of Software development and have acquired Software Programming Fundamentals

### Objectives

After completing this course, the student should be able to

- Understand Software Development Process
- Analyse requirements and produce program specifications
- Conduct a structured analysis and design
- Drive a Software Planing
- Drive Software Quality Assurance
- Drive Software testing

### Agenda

Each unit in this course is two hours in duration.

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### *OO Analysis and Design Using UML (CY440)*

#### Duration

The duration of the course is 16 hours.

#### Purpose

This course develops skills in gathering and defining requirements, analyzing and designing applications using object technology. The methodology used to showcase the application development process is the Rational Unified Process. The course focuses on requirements, analysis and design covering techniques for building and evaluating use cases, static object models, and dynamic (interaction and state) models. The lab exercises gives the students the opportunity to build, use, and evaluate their models in the context of application development. The course gives them a chance to experience a typical OO lifecycle including incremental and multiple iterations of model development. The students are able to evaluate their designs by looking at potential changes to the application. This change impact analysis allows the students to understand how to evaluate the robustness of their designs, and how to redesign their applications using design patterns to make them better suited to handle changes in the future.

#### Audience

Any individual involved in using Object Technology to analyze and design applications including project managers, architects, designers, analysts, and developers

#### Prerequisites

Before taking this course, you should understand the basics of Software development and OO programming

#### Objectives

On completing this course, students should be able to:

- Use an OO methodology (Rational Unified Process) in analyzing and designing applications.
- Describe OO distributed architectures and their impact in analysing and designing OO applications
- Determine and create a set of use cases for an application.
- Demonstrate strategies for finding candidate objects/classes in a problem domain.
- Build analysis and design modeling work products
- Evaluate the quality of analysis and design modeling work products.
- Document work products in the UML modeling notation and capture using a CASE tool.
- Design class responsibilities and class method interfaces.
- Design appropriate implementations of relationships between classes.
- Review/inspect modeling work products.
- Perform change impact analysis to understand how well a design can handle perceived changes to the application.
- Describe how to use design patterns to redesign an application to be more robust to handling changes

#### Agenda

Each unit in this course is two hours in duration.

## Web Application Developer Course Descriptions

### Module 5 – Advanced Web Development

#### ***e-Business Technology Fundamentals (CY750)***

**Duration**

The duration of the course is 16 hours.

**Purpose**

This course offers students an overview of e-Business fundamentals and the various e-Business technologies. The courseware is divided into two volumes for easier reading.

The first volume of this course deals with e-Business – definitions and the use and need for e-Business. Other e-Business concepts discussed are business patterns and solution spaces, how to transform an existing business into an e-Business, and the characteristics of successful e-Business applications. The concept of a design space in e-Business building blocks is also discussed.

This volume also talks about fundamental e-Business technologies and the concept of pervasive computing. Other topics covered include client building blocks, client side processing, server side processing, HTTP basic flow, basic applications of the Internet, using ISP to access a network, the need for intranets and extranets, the World Wide Web, connectors and data structures, Java Database Connectivity (JDBC), and network security issues.

The second volume gives an overview of Customer Relationship Management (CRM). It differentiates between Common Object Request Broker Architecture (CORBA) and Enterprise JavaBeans (EJBs). It deals with e-Commerce, and the ways in which an application communicates with another application, the functionality of a message broker, etc. It also gives the definition of an e-marketplace. Besides, this volume also provides a definition of business intelligence, a description of data warehousing, differentiates between a data warehouse and a data mart, the different decision support tools, the types of data analysis tools, and also multidimensional data analysis.

**Audience**

This course is designed for application developers who want to gain practice on e-business application programming.

**Prerequisites**

CY710 or CY500

**Objectives**

After completing this course, you should be able to:

- Define and describe e-Business
- Discuss how to transform an existing business into an e-Business
- Discuss the concept of a design space within an e-Business building block
- Discuss the different e-Business technologies
- Define pervasive computing
- Describe client side and server side processing
- Discuss the need for intranets and extranets
- Discuss the different aspects of network security
- Explain performance issues in networks as well as in servers
- Discuss Customer Relationship Management (CRM)
- Differentiate between CORBA and EJB
- Define e-Commerce and differentiate between the types of e-Commerce
- Discuss about online auctions and the different online payment modes
- Differentiate between B2B and B2C
- Define business intelligence
- Define a data warehouse and state how it is different from a data mart
- Describe the different decision support tools
- List the types of data analysis tools
- Define multi-dimensional data analysis

**Agenda**

Each unit in this course is two hours in duration.

#### ***Design Methodology and Technology (CY500) V2***

**Duration**

The duration of the course is 30 hours.

**Purpose**

Design Methodology and Technology is a course that teaches students how to create and manage Web sites with tools such as Microsoft FrontPage, Macromedia Dreamweaver and Flash, Dynamic HTML, and various multimedia and CSS standards. Students will also implement the latest strategies to develop third-generation Web sites, evaluate design tools, discuss future technology standards, and explore the incompatibility issues surrounding current browsers. The course focuses on theory, design and Web construction, along with information architecture concepts, Web project management, scenario development and performance evaluations.

**Audience**

This course is designed for students interested in learning the basic skills required to create Web pages.

## Web Application Developer Course Descriptions

### Prerequisites

None

### Objectives

After completing this course, students will be able to:

- Explain and implement Web design concepts, including page layout, multimedia, font and color selection, graphic images, audience usability, file hierarchy, and navigation.
- Manage the Web site development process, develop a Web strategy with goals and tactics to support it, and implement techniques such as mindmapping and the site metaphor concept.
- Choose and implement basic Web technologies, such as HTML tables and frames, metadata, and Cascading Style Sheets.
- Use Web production applications and tools to create and manage pages and sites, create animated GIFs, edit graphic image files, and create multimedia files.
- Explain and implement advanced Web technologies, including scripting languages, Dynamic HTML, Extensible Markup Language (XML), server-side technologies, Java applets, and plug-ins.
- Explain the functions of Web servers, server administration ports, cookies, databases, and database management systems.
- Identify the Internet governing organizations, research Internet standards, and register a domain name.
- Compare in-house Web site hosting to hosting with an Internet Service Provider, and publish sites to the Web using various tools and techniques.
- Complete development of a functional Web site.

Overview of Design Concepts

Web Page Layout and Elements

Web Site Usability Testing

Navigation Concepts

Web Graphics

Multimedia and the Web

The Web Development Process

Mindmapping

Web Site Implementation Factors

HTML Standards and Compliance

HTML Tables and Web Page Structure

HTML Frames

Metadata and the Web

Cascading Style Sheets

Site Development with Microsoft Frontpage

FrontPage – Basic Features

FrontPage – Advanced Features

Site Development with Macromedia

Dreamweaver MX

Macromedia Dreamweaver MX – Basic Features

Macromedia Dreamweaver MX – Advanced Features

Web Pages with Macromedia HomeSite 5

Image Editing with Macromedia Fireworks MX

Multimedia with Macromedia Flash MX

JavaScript Fundamentals

Dynamic HTML

Extensible Markup Language (XML)

HTTP Servers

Cookies

Downloadables and Plug-Ins

Java Applets

Databases

Standards Organizations

Web Site Publishing

### Agenda

Each unit in this course is two hours in duration.

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### Web Programming 2 (ASP, CGI, VBScript) (CY720)

#### Duration

The duration of the course is 32 hours.

#### Purpose

This course offers students an overview of VBScript. The first part of the course introduces programming with VBScript, along with some of the preliminary concepts like VBScript variables, operators, control structures and procedures. the course also covers ActiveX controls, Objects and creating cookies with VBScript.

The second part of the course provides an overview of the common gateway interface. Students will learn CGI fundamentals, features of the Perl scripting language, Perl operators, conditionals and loops. This part of the course also teaches pattern matching, working with form data and session management with cookies.

The third part of the course offers an overview of Active Server Pages. Students will learn the ASP syntax, how to create ASP scripts and how an ASP file works. They will also learn objects and session management. The course teaches application objects, ASP components, debugging and error- handling.

The course incorporates several lab sessions where students will be able to gain practical experience on Web Programming.

#### Audience

This course is designed for application developers who want to gain practice on Web programming.

#### Prerequisites

Students attending this course should be familiar with OO Programming and Java

#### Objectives

## Web Application Developer Course Descriptions

After completing this course, you should be able to:

- Declare variables and arrays, and explain conditional statements
- Discuss sub-routines and functions
- Define cookies and explain how to manage cookies, using VBScript
- Discuss how to communicate with ActiveX controls
- Discuss the need for CGI in web application development
- Discuss how CGI and Perl are related
- Explain how to create ASP
- Explain how to work with ASP objects and collections
- State ASP can be used for session management
- Describe server objects, and their instantiation
- Discuss ASP preprocessing directives and SSIs

### Agenda

Each unit in this course is two hours in duration.

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### **WebSphere Studio Workshop (CY520) V2**

#### Duration

The duration of the course is 36 hours.

#### Purpose

This course is targeted at students who will be developing and testing server-side applications. The course illustrates the use of IBM WebSphere Studio to build Web applications. Students will explore the features of WebSphere Studio that can be exploited for developing static and dynamic Web pages, images, Java-applets, and server-side programs that interact with databases.

Students will also learn how to publish static Web pages, images and other resources to a web server. IBM HTTP Server will be used for publishing the static content.

Students will learn how to deploy Java Servlets and JSP pages to an Application Server. The IBM WebSphere Application Server Advanced Single Server Edition will be used for deployment.

Students will also work with various wizard features available in WebSphere Studio that would help them in developing Web Applications quickly.

#### Audience

Students, Professionals, and Business people

#### Prerequisites

Knowledge of HTML, Style sheets, Java programming and SQL.

#### Objectives

**At the end of this course, you will be able to:**

- Explain the WebSphere family of products
- Explain Web Applications
- Develop static HTML documents using Page Designer
- Create images using WebArt Designer
- Create applets using Applet Designer
- Understand the dynamic content concepts
- Develop Java Server Pages (JSPs) using Page Designer
- Deploy JSPs and Servlets to WebSphere Application Server (WAS)
- Create Web applications using WebSphere Studio Wizards
- Describe how to use Page Detailer to analyze a Web page viewed with a browser

#### Agenda

Each unit in this course is two hours in duration.

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### **e-Business Security (CY740) - AVAILABLE IN LATE 2003**

#### Duration

The duration of the course is 16 hours.

#### Purpose

This course is an overview of standards and technologies which exist to secure networks and users connected to the Internet.

#### Audience

Students, Professionals, and Business people

#### Prerequisites

None

#### Objectives

- Identify the components of Security
- Identify the risks involved in connecting to the Internet and understand the concept and the opportunity of a Security Policy



## Web Application Developer Course Descriptions

- Understand the tools supplied by Cryptography for Network Security
- Understand the services provided by Network Security Standards
- Understand the importance and the complexity of the Legal Issues of e-business

### Agenda

Each unit in this course is two hours in duration.

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### ***e-Commerce Strategies and Practices (CY550)***

#### **Duration**

The duration of the course is 18 hours.

#### **Purpose**

This course teaches students how to conduct business online and the technological issues associated with constructing an electronic-commerce Web site. Students will implement a genuine transaction-enabled business-to-consumer Web site, examine strategies and products available for building electronic-commerce sites, examine how such sites are managed, and explore how they can complement an existing business infrastructure. Students get hands-on experience implementing the technology to engage cardholders, merchants, issuers, payment gateways and other parties in electronic transactions

#### **Audience**

Network server administrators, firewall administrators, systems administrators, application developers, IT security officers and Webmasters

#### **Prerequisites**

Students must have Internet Fundamentals and Networking Essentials knowledge or equivalent experience.

#### **Objectives**

Design and implement commerce-driven Web sites; identify customer needs; monitor customer usage patterns; determine order processes and service after sales; and consider how e-business solutions can increase sales.

Electronic Commerce Foundations	Site Development Software Implementation
Law and the Internet	Developing an Electronic Commerce Site
Marketing Goals	Customizing the E-Commerce Site
	Foundation
Site Usability	Online Catalogs
E-Commerce Consumer Service Methods	Using and Configuring Payment Gateways
Business-to-Business Frameworks	E-Services Support
Business-to-Business Market Places	Transaction Security
Implementation and Case Studies	Web Site Management and Options
Electronic Commerce Site-Creation Software	Inventory and Shipping Data

### Agenda

Each unit in this course is two hours in duration.

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### ***Enterprise Application Development Using XML (CY730)***

#### **Duration**

The duration of the course is 44 hours.

#### **Purpose**

This course offers students an overview of development using XML. The first volume of the course deals with the XML syntax and its advantages. It also covers the features of Document Type Definition. Students will understand the purpose of DTDs, symbols of DTDs, and their meanings. They will also learn how to create the DTD for an existing XML file.

The second volume of the course deals with XML namespaces, namespace scope and processing and the problems related to namespaces. It also provides an overview of the features of XML Schema, various XML Schema elements, and how to create XML Schema files.

The third volume of the course relates to XML transformations, XSLT elements and their usage. It teaches how to transform simple XML documents using XSL. Students will learn about XPath, their functions and uses. They will also learn about the XSLT elements related to conditional processing.

The fourth volume of the course deals with the Document Object Model. It provides an introduction to parsers, the standard set of parsers available, and the DOM parser. Students will learn about the history of SAX, its fundamentals, and the event-driven model of SAX. They will also learn about how SAX parsers work, SAX interfaces and the methods associated with them.

The fifth volume of the course provides an overview of databases with XML and web services. It provides an introduction to XML and databases, the advantages of using the n-tier approach and using XML in an n-tier application. It teaches about the XML Query Language and XQL patterns. Students will be introduced to web services, its architecture, and advantages. They will also learn about Simple Object Access Protocol, its building blocks and implementation through Java.

The course incorporates several Lab sessions where students would be able to gain practical experience in developing XML and web services.

#### **Audience**

This course is designed for application developers who want to gain practice on Web programming.

## Web Application Developer Course Descriptions

### Prerequisites

CY710, CY420, CY350

### Objectives

After completing this course, you should be able to:

- Describe how to create simple XML documents
- Explain how to create the DTD for an existing XML file
- List the best practices when using namespaces
- Discuss the data types and facets of XML schema
- Illustrate how to create sample XML schema files, and validate XML against them
- Discuss the importance of XSL transformations
- Discuss the concept of XPath
- Discuss sorting and the repetition elements of XSLT
- Discuss the DOM parser
- Describe node types, hierarchy, and the techniques involved in parsing
- Describe the event-driven model of SAX and explain how SAX parsers work
- Discuss the differences between DOM and SAX parsers
- Explain the concepts of XML and databases
- Describe the XML Query Language and explain how to generate XML from JDBC
- Discuss web services architecture and Explain the creation and uses of web services
- Discuss SOAP implementation in Java
- Explain SOAP using web services

### Agenda

Each unit in this course is two hours in duration.

## Web Application Developer Course Descriptions

### Breakdown of Hours by Course (Lecture and Lab)

Title	Dur	Lecture	Lab
<b>Introduction to PCs &amp; MS Windows</b>	12	7	5
Unit 1: Introduction to PCs		2	
Unit 2: Windows 2000 Fundamentals		1	
Unit 3: Windows 2000 Fundamentals Lab.			1
Unit 4: Working with Files and Folders		1	
Unit 5: Working with Files and Folders Lab.			1
Unit 6: Working with Editors		1	
Unit 7: Working with Editors Lab.			1
Unit 1: Customizing Windows 2000		1	
Unit 2: Customizing Windows 2000 Lab.			1
Unit 3: Optimization and Maintenance		1	
Unit 4: Optimization and Maintenance Lab.			1
<b>Internet Fundamentals**</b>	6	6	0
Unit 01: Overview of the Internet		0.5	
Unit 02: Browsing the World Wide Web		0.5	
Unit 03: E-Mail		0.5	
Unit 04: FTP, Newsgroups, and Telnet		0.5	
Unit 05: Objects, Plug-ins, and Viewers		1	
Unit 06: Search Engines		1	
Unit 07: Security		1	
Unit 08: E-Commerce		1	
<b>Computer Architecture &amp; Operating Systems</b>	28	26	2
Unit 1: Computer Organization		2	
Unit 2: Digital Logic		2	
Unit 3: Number Systems - Integer Representation		2	
Unit 4: Number Systems - Real Number Representation		2	
Unit 5: Number Systems Lab			2
Unit 1: CPU & Memory Organization		2	
Unit 2: Input/Output Organization		2	
Unit 3: RISC and CISC Architecture		2	
Unit 1: Overview of Systems Programming		2	
Unit 2: Overview of Operating Systems		2	
Unit 3: Process Management		2	
Unit 4: Memory Management		2	
Unit 5: File Management		2	
Unit 6: Device Management		2	
<b>Linux Basics</b>	26	16	10
Unit 1: Linux Fundamentals		2	
Unit 2: The Linux System		2	
Unit 3: The Linux System Lab.			2
Unit 4: Linux File Structure		2	
Unit 5: Linux File Structure Lab.			2
Unit 6: The vi Editor		2	
Unit 7: The vi Editor Lab.			2
Unit 1: Shell Basics		2	
Unit 2: Shell Basics Lab.			2
Unit 3: Shell Features		2	
Unit 4: Shell Features Lab.			2
Unit 5: Processes in Linux		2	
Unit 6: Customizing the User Environment		2	
<b>Programming Fundamentals</b>	16		
Unit 1 - Computer Programs		2	

## Web Application Developer Course Descriptions

Unit 2 - Structured Design Concepts		2	
Unit 3 - Logic		2	
Unit 4 - Flow Charting		2	
Unit 5 - Pseudocode		2	
Unit 6 - Data Representation		2	
Unit 7 - Input and Output		2	
Unit 8 - Data Processing Examples (Optional)		2	
<b>Introduction to Programming with C</b>	56	30	26
Unit 1: Introduction to Computing		2	
Unit 2: Introduction to Computing Lab.			2
Unit 3: Programming in C - The First Steps		2	
Unit 4: Building a Strong Foundation in C		2	
Unit 5: Programming in C Lab.			2
Unit 1: Decision Control Structure		2	
Unit 2: Decision Control Structure Lab.			2
Unit 3: Iterative Constructs		2	
Unit 4: Iterative Constructs Lab.			2
Unit 5: More Iterative Constructs		2	
Unit 6: More Iterative Constructs Lab.			2
Unit 1: Programming with Arrays		2	
Unit 2: Multi-Dimensional Arrays		2	
Unit 3: Programming with Arrays Lab.			2
Unit 4: Structures		2	
Unit 5: Structures Lab.			2
Unit 1: Functions		2	
Unit 2: Functions Lab.			2
Unit 3: Recursion		2	
Unit 4: Recursion Lab.			2
Unit 1: Pointers		2	
Unit 2: Pointers Lab.			2
Unit 3: Advanced Pointers		2	
Unit 4: Advanced Pointers Lab.			2
Unit 1: File Handling in C		2	
Unit 2: File Handling in C Lab.			2
Unit 3: Additional Features of C		2	
Unit 4: Advanced Topics Lab.			2
<b>Data Structures and Algorithms</b>	32	18	14
Unit 1: Data Structures and Analysis of Algorithms		2	
Unit 2: Linked List		2	
Unit 3: Linked List Lab.			2
Unit 4: Stack		2	
Unit 5: Stack Lab.			2
Unit 6: Queue		2	
Unit 7: Queue Lab.			2
Unit 1: Graphs		2	
Unit 2: Trees		2	
Unit 3: Simple Sorting Techniques		2	
Unit 4: Simple Sorting Techniques Lab.			2
Unit 5: Advanced Sorting Techniques		2	
Unit 6: Advanced Sorting Techniques Lab.			2
Unit 7: Searching Techniques		2	
Unit 8: Searching Techniques Lab.			2
Unit 9: Hash Table Lab.			2
<b>RDBMS Concepts and SQL</b>	32	18	14
Unit 1: Introduction to RDBMS		2	
Unit 2: Entity Relationship Diagram		2	

## Web Application Developer Course Descriptions

Unit 3: Database Normalization	2		
Unit 4: Database Design Lab.		2	
Unit 1: Structured Query Language - Fundamentals	2		
Unit 2: SQL Fundamentals Lab.		2	
Unit 3: Advanced SQL	2		
Unit 4: Advanced SQL Lab.		2	
Unit 1: DB2 Fundamentals	2		
Unit 2: DB2 UDB Tools Lab.		2	
Unit 3: Creating and Managing Database Objects	2		
Unit 4: Database Objects Lab.		2	
Unit 5: Data Dictionary, Database Access and Security	2		
Unit 6: Data Dictionary Lab.		2	
Unit 7: Programming Structure, UDT and UDF	2		
Unit 8: Programming Structure, UDT and UDF Lab.		2	
<b>Networking Essentials</b>	16	14	2
Unit 1: ISO-OSI Layers		2	
Unit 2: Internet Protocol		2	
Unit 3: IP Protocol Lab.			2
Unit 4: Transmission Control Protocol		2	
Unit 5: Network and Application Layer Protocols		2	
Unit 6: Sockets and Remote Procedure Call		2	
Unit 1: Network Devices		2	
Unit 2: Network Management Fundamentals		2	
<b>Object Oriented Programming with C++</b>	60	34	26
Unit 1: Overview of Object Oriented Concepts		2	
Unit 2: Classes and Objects		2	
Unit 3: Classes and Objects Lab.			2
Unit 4: Applying Object Oriented Concepts		2	
Unit 5: Applying Object Oriented Concepts Lab.			2
Unit 1: C++ is Better than C		2	
Unit 2: Classes and Objects		2	
Unit 3: More of Classes and Objects		2	
Unit 4: Classes and Objects Lab.			2
Unit 5: Inheritance		2	
Unit 6: Inheritance Lab.			2
Unit 7: Constants and References		2	
Unit 8: Constants and References Lab.			2
Unit 1: Polymorphism and Virtual Functions		2	
Unit 2: Polymorphism and Virtual Functions Lab.			2
Unit 3: Operator Overloading		2	
Unit 4: Operator Overloading Lab.			2
Unit 5: Multiple Inheritance and RTTI		2	
Unit 6: Multiple Inheritance Lab.			2
Unit 1: Templates		2	
Unit 2: Templates Lab.			2
Unit 3: Advanced Templates		2	
Unit 4: Advanced Templates Lab.			2
Unit 5: Raising and Handling Exceptions		2	
Unit 6: Raising and Handling Exceptions Lab.			2
Unit 7: Creating Own Exceptions		2	
Unit 8: Creating Own Exceptions Lab			2
Unit 1: C++ Streams		2	
Unit 2: I/O on User Defined Class		2	
Unit 3: Input and Output Lab.			2
<b>Core Java</b>	88	48	40
Unit 1: Overview of Java		2	

## Web Application Developer Course Descriptions

Unit 2: Operators, Expressions and Control Flow	2	
Unit: 3 Operations, Expressions and Control Flow Lab.		2
Unit 1: Classes, Objects and References	2	
Unit 2: Classes, Objects and References Lab.		2
Unit 3: Inheritance	2	
Unit: 4 Inheritance Lab.		2
Unit 5: Abstract Classes and Interfaces	2	
Unit 6: Abstract Classes and Interfaces Lab.		2
Unit 7: Packages	2	
Unit 1:Exception Handling and Types of Exceptions	2	
Unit 2: Raising & Handling Exceptions	2	
Unit 3: Raising and Handling Exceptions Lab.		2
Unit 1: Files and Streams	2	
Unit 2: Files and Streams Lab.		2
Unit 3: Object Serialization	2	
Unit 4: Object Serialization Lab.		2
Unit 1: AWT Components and Containers	2	
Unit 2: AWT Components and Containers Lab.		2
Unit 3: Layout Managers	2	
Unit 4: Layout Managers Lab.		2
Unit 5: Event Driven Model and Event Handling	2	
Unit 6: Event Driven Model and Event Handling Lab.		2
Unit 1: Writing and Deploying Applets	2	
Unit 2: Writing and Deploying Applets Lab.		2
Unit 1: Creating Threads	2	
Unit 2: Creating Threads Lab.		2
Unit 3: Thread Synchronization	2	
Unit 4: Thread Synchronization Lab.		2
Unit 5: Working with URLs and Socket Programming	2	
Unit 6: Working with URLs and Socket Programming Lab.		2
Unit 1: Collections API	2	
Unit 2: Collections API Lab.		2
Unit 3: JDBC	2	
Unit 4: JDBC Lab.		2
Unit 5: Advanced JDBC	2	
Unit 6: Advanced JDBC Lab.		2
Unit 7: Reflection API	2	
Unit 8: Reflection API Lab.		2
Unit 9: Advanced Features	2	
Unit 10: Advanced Features Lab.		2
Unit 1: MVC Architecture and Swing Classes	2	
Unit 2: Swing Components	2	
Unit 3: Swing Components Lab.		2
<b>DB Programming and Stored Procedures</b>	40	22
Unit 1: DB2 Programming Using Java		2
Unit 2: DB2 Programming Using Java Lab.		2
Unit 3: DB2 Application Building Concepts	2	
Unit 4: DB2 Application Building Concepts Lab.		2
Unit 5: DB2 Triggers	2	
Unit 6: DB2 Triggers Lab.		2
Unit 7: Embedded SQL	2	
Unit 8: Embedded SQL Lab.		2
Unit 1: DB2 Stored Procedures and SQL/PL	2	
Unit 2: Stored Procedure Builder	2	
Unit 3: SQL/PL Stored Procedure Lab.		2
Unit 4: DB2 Stored Procedures and Java	2	
Unit 5: Stored Procedure Using Java Lab.		2

## Web Application Developer Course Descriptions

Unit 1: Programming Structure, UDT, and UDF	2		
Unit 2: Programming Structure, UDT, and UDF Lab.		2	
Unit 3: Using Large Objects	2		
Unit 4: Using Large Objects Lab.		2	
Unit 1: Concurrency Control and Protocols	2		
Unit 2: Writing Efficient Database Applications	2		
Unit 3: Comprehensive DB2 Lab.		2	
<b>Software Engineering</b>	24	20	4
Unit 1: Software Engineering Fundamentals		2	
Unit 2: Software Requirement Specifications		2	
Unit 3: Data Flow Diagrams		2	
Unit 4: Data Flow Diagrams Lab.			2
Unit 5: Software Design		2	
Unit 6: Structured Design		2	
Unit 7: Structured Design Lab.			2
Unit 1: Software Metrics and Planning		2	
Unit 2: Software Planning		2	
Unit 3: Software Quality Assurance		2	
Unit 4: Software Testing Fundamentals		2	
Unit 5: Testing Methodologies		2	
<b>OO Analysis and Design using UML</b>	16	12	4
Unit 1: Basic Structural Modeling		2	
Unit 2: Advanced Structural Modeling		2	
Unit 3: Structural Modeling Lab.			2
Unit 1: Basic Behavioral Modeling		2	
Unit 2: Advanced Behavioral Modeling		2	
Unit 3: Behavioral Modeling Lab.			2
Unit 4: Architectural Modeling		2	
Unit 5: Object Oriented Testing Methodologies		2	
<b>e-Business Technology Fundamentals</b>	16	16	0
Unit 1: Basics of e-business		2	
Unit 2: e-business Technologies		2	
Unit 3: e-business Building Blocks		2	
Unit 1: Customer Relationship Management		2	
Unit 2: E-Commerce		2	
Unit 3: Enterprise Application Integration		2	
Unit 4: Supply Chain Management		2	
Unit 5: Business Intelligence		2	
<b>Design Methodology &amp; Technology (not broken into separate lecture and lab hours)</b>	30	30	0
Lesson 1: Overview of Web Design Concepts		0.5	
Lesson 2: Web Page Layout and Elements		1	
Lesson 3: Web Site Usability Testing		0.25	
Lesson 4: Navigation Concepts		1	
Lesson 5: Web Graphics		1	
Lesson 6: Multimedia and the Web		1	
Lesson 7: The Web Development Process		1	
Lesson 8: Mindmapping		0.25	
Lesson 9: Web Site Implementation Factors		0.5	
Lesson 10: HTML Standards and Compliance		0.5	
Lesson 11: HTML Tables and Page Structure		1.25	
Lesson 12: HTML Frames		1.25	
Lesson 13: Metadata and the Web		0.5	
Lesson 14: Cascading Style Sheets		0.5	
Lesson 15: Site Development with Microsoft FrontPage 2000: Introduction		1	

## Web Application Developer Course Descriptions

Lesson 16: Site Development with FrontPage 2000Basic Features	1		
Lesson 17: Site Development with FrontPage 2000Advanced Features	1		
Lesson 18: Site Development with Macromedia Dreamweaver 4.0: Introduction	0.75		
Lesson 19: Site Development with Dreamweaver 4.0Basic Features	1		
Lesson 20: Site Development with Dreamweaver 4.0Advanced Features	1		
Lesson 21: Web Pages with Macromedia HomeSite 5	0.5		
Lesson 22: Images with Jasc Paint Shop Pro	1		
Lesson 23: Multimedia with Macromedia Flash 5.0	0.25		
Lesson 24: Multimedia with Flash 5.0Timeline and Layers	0.25		
Lesson 25: Multimedia with Flash 5.0Symbols and Buttons	0.5		
Lesson 26: Multimedia with Flash 5.0Tweens	0.5		
Lesson 27: Multimedia with Flash 5.0Movie Clips	0.5		
Lesson 28: Multimedia with Flash 5.0Tell Targets and Masks	0.5		
Lesson 29: JavaScript Fundamentals	1		
Lesson 30: Dynamic HTML	0.75		
Lesson 31: Extensible Markup Language (XML)	0.5		
Lesson 32: HTTP Servers	0.5		
Lesson 33: Cookies	0.25		
Lesson 34: Downloadables and Plug-Ins	0.5		
Lesson 35: Java Applets	1		
Lesson 36: Databases	0.5		
Lesson 37: Standards Organizations	0.5		
Lesson 38: Web Site Publishing	0.75		
Course Assessment Project: Building Your Web Site (optional)	3.5		
Lesson 6: Customer Relationship Management (CRM) and E-Services	1		
Lesson 7: Business-to-Business Frameworks	2		
Lesson 8: E-Commerce Site Creation Packages Outsourcing	4.5		
Lesson 9: E-Commerce Site Creation Software	1.5		
Lesson 10: Site Development Software Implementation-Microsoft Platform	1.5		
Lesson 11: E-Commerce Site Development Using Commerce Server	2		
Lesson 12: Online Catalog	3		
Lesson 13: Payment Gateways	1.5		
Lesson 14: E-Services Support	1.5		
Lesson 15: Transaction Security	2		
Lesson 16: Web Site Management and Performance Testing	2		
<b>Web Programming 2 (ASP, CGI, VBScript)</b>	32	16	16
Unit 1: VBScript Fundamentals		2	
Unit 2: VBScript Fundamentals Lab.			2
Unit 3: Advanced VBScript		2	
Unit 4: Advanced VBScript Lab.			2
Unit 1: Perl and CGI Fundamentals		2	
Unit 2: Perl and CGI Fundamentals Lab.			2
Unit 3: Web Application Development		2	
Unit 4: Web Application Development Lab.			2
Unit 5: Database Access using Perl		2	
Unit 6: Database Access Using Perl Lab.			2
Unit 1: ASP Fundamentals		2	
Unit 2: ASP Fundamentals Lab.			2
Unit 3: Built-in ASP Objects		2	
Unit 4: Built-in ASP Objects Lab.			2
Unit 5: Accessing Relational Data with ASP		2	
Unit 6: Accessing Relational Data with ASP Lab.			2
<b>IBM WebSphere Studio</b>			
Unit 1: WebSphere Studio - Overview	34	22	12
Unit 2: Getting Started with WebSphere Studio		2	
Unit 1: HTML Creation with Page Designer - Basics		2	
Unit 2: HTML Creation with Page Designer-Basics Lab.		2	



## Web Application Developer Course Descriptions

Unit 3: HTML Creation with Page Designer-Intermediate		2	
Unit 4: HTML Creation with Page Designer-Intermediate Lab.	2		
Unit 5: HTML Creation with Page Designer - Advanced		2	
Unit 6: HTML Creation with Page Designer - Advanced Lab.	2		
Unit 1: Working with Applet Designer		2	
Unit 2: Working with Applet Designer Lab.	2		
Unit 1: Server-Side Programming Concepts		2	
Unit 2: Building JSP with Page Designer-Basics	2		
Unit 3: Building JSPs with Page Designer -Basics Lab.	2		
Unit 4: Building JSP with Page Designer -Advanced		2	
Unit 5: Building JSP with Page Designer - Advanced Lab.	2		
Unit 1: Studio Wizards		2	
Unit 2: Studio Advanced Edition Features	2		
Unit 3: WebSphere Studio Wizards Lab.	2		
AC: Case Study			v
<b>E - Commerce Strategies &amp; Practices (not broken into separate lectures and lab hours)</b>	30	30	
Lesson 1: Electronic Commerce Foundations		2	
Lesson 2: Law and the Internet		1.5	
Lesson 3: Web Marketing Goals		1.5	
Lesson 4: Online Product Promotion		2	
Lesson 5: Site Usability		0.5	
Lesson 6: Customer Relationship Management (CRM) and E-Services		1	
Lesson 7: Business-to-Business Frameworks		2	
Lesson 8: E-Commerce Site Creation PackagesOutsourcing		4.5	
Lesson 9: E-Commerce Site Creation Software		1.5	
Lesson 10: Site Development Software Implementation-Microsoft Platform		1.5	
Lesson 11: E-Commerce Site Development Using Commerce Server		2	
Lesson 12: Online Catalog		3	
Lesson 13: Payment Gateways		1.5	
Lesson 14: E-Services Support		1.5	
Lesson 15: Transaction Security		2	
Lesson 16: Web Site Management and Performance Testing		2	
<b>Enterprise Application Development using XML</b>	44	22	22
Unit 1: Introduction to XML		2	
Unit 2: Introduction to XML Lab.			2
Unit 3: Document Type Definition and XML		2	
Unit 4: Document Type Definition and XML Lab.			2
Unit 1: XML Namespaces		2	
Unit 2: XML Namespaces Lab.			2
Unit 3: XML Schema		2	
Unit 4: XML Schema Lab.			2
Unit 1: XSL Transformations - I		2	
Unit 2: XSL Transformations - I Lab.			2
Unit 3: XSL Transformations - II		2	
Unit 4: XSL Transformations - II Lab.			2
Unit 1: Document Object Model		2	
Unit 2: Document Object Model Lab.			2
Unit 3: Simple API for XML		2	
Unit 4: Simple API for XML Lab.			2
Unit 1: Databases and XML		2	
Unit 2: Databases and XML Lab.			2
Unit 3: Introduction to Web Services		2	
Unit 4: Simple Object Access Protocol (SOAP)		2	
Unit 5: Simple Object Access Protocol (SOAP) Lab.			2
Unit 6: Comprehensive Lab.			2